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HEATING AND VENTILATION.

IN spite of the fact that the most marked improvement has been made in the sanitary fittings of our dwellings, and the most wonderful advancement may be noted in almost everything we require for our convenience or comfort, or indulge ourselves in as matters of luxury, it is remarkable that even in our most costly buildings, and those that are equipped in the most elegant and expensive fashion, the problem of heating and ventilation remains practically unsolved, and we are subjected to the same extremes of heat and cold and draught and stagnant air as were the dwellers in the houses of two centuries ago.

A first class office with all modern improvements, one for which the tenant pays $1,800 per year or upward is, as far as this portion of the arrangements are concerned, as far behind the progressive spirit of the age as the log cabin or the hillside "dugout" of the pioneer. The occupant turns on the steam heat, and the temperature rises until the thermometer indicates almost fever heat. He endures this as long as he can, working with congested brain, flushed face and labored respiration, then becoming desperate he flings the door open or raises or lowers the windows, and a current of cold air rushes into the room. He may be in haste to finish a piece of work and sitting down again to his desk intent upon his business, does not realize that the atmosphere is almost frosty, until his benumbed fingers refuse longer to hold his pen, or a sudden chill makes his teeth chatter. Then he as hastily rises and as impatiently closes both door and window, only to repeat the same process of alternate freezing and burning, until his health is altogether ruined and he gives up his business, because of what his physician calls "overwork." Just how many attacks of apoplexy, how many brain disorders and how much pneumonia are directly traceable to the present wretched system of ventilation, or more correctly speaking, no system at all, any observant person who looks through our fine buildings will have no difficulty in determining.

There is another phase of this difficulty that is rarely touched upon, but which is nevertheless a serious one.

This is, the popular notion that a certain given temperature is healthful, and that it should be maintained in apartments where many persons are employed. Thermometer in hand, some of these warm blooded people, with good circulation and superabundant vitality, stand guard against the closing of windows or ventilators, the while discoursing loudly upon the injurious effects of high temperature and the benefits attending an abundance of fresh air. In this way one person may destroy the comfort and quite likely the health of a score of delicate persons, whose feeble circulation and low vitality are unable to endure the tax made upon them by too much cold air. *Heat is life, and cold is death,* and when once this truth is properly understood and appreciated the world will be very much better and more comfortable for it.

It is a well established fact that an extraordinarily active brain is quite likely to accompany a delicate temperament. To create warmth taxes the vital powers, and takes just so much from forces that might otherwise be employed to build up brain power.

There are many persons who cannot do good work in a cold atmosphere, and very many to whom the "regulation" temperature of the hygienists is absolute mental stagnation and physical misery.

It is a fact not generally appreciated, that warm air is not necessarily impure air. The thermometric enthusiasts forget this, and guided only by their own high temperature and supported by the mercury in the tubes, they inflict untold suffering and often fatal consequences upon their more delicate fellows.

With anything like a proper system of ventilation and heating, the air of a room may be kept almost absolutely pure, even though there are half a dozen persons in it and the thermometer stands at 85°. But it cannot be done by steam or furnace heat as at present employed.

In the majority of cases the fresh air box opens out upon an area way where garbage cans and the odors from the cellar poison the atmosphere and where in damp days the unwholesomeness of the entire vicinity settles. This vitiated air is drawn into the furnace box and after the disease germs with which it is laden are warmed into life they are distributed throughout the entire dwelling.

It is an open question among the more enlightened sanitarians, whether a furnace constructed on such principles should not furnish cause of action for damages. Typhoid and malarial fever can often be traced directly to the practice of taking air from area ways with the heaters.

No air supply pipe should open at a point below the second story of a house. If it runs to the third or fourth story so much the better as long as the chimney extends some distance above it. The higher the inlet the purer the air will be. A house in which air is taken from the ground level, and heated for human beings to breathe is unfit to live in.

The board of health should make this a special point in their regulations and at once stop such an injurious practice.

As for the furnace where there is *no* outside air pipe at all, where the air is drawn in directly from the cellar itself, such a place is simply a sanitary abomination. That children die by thousands is not in any sense remarkable. The only wonder is that any of them live under such unfavorable circumstances.

The dwelling houses in which there is anything approaching ventilation are exceedingly rare. A small grating is sometimes seen in the wall near the ceiling, but if this has out of door or chimney connection it draws nearly all of the warm air out of the room.

Any ordinary means for supplying that which is fresh and pure is certain to be productive of cold floors and currents of air around the feet, than which nothing is more injurious to health or dangerous to life.

Another point in the subject of heating is the enormous waste of fuel. As a rule eighty-five per cent of the heat goes out to warm the world, or heats the chimney through which it passes. Observe the outside of the wall of some large building. In storm, rain or snow, there is a large dry space with a line above it, showing where the heat pours up the chimney to be dissipated in the atmosphere. Enter the building and it is more than likely that the rooms are cold and the air heavy and unwholesome.

Examine the heating apparatus and it will be found that the consumption of fuel necessary even for this meagre supply of warmth is altogether out of proportion with the amount of heat supplied.

J. P. Putman, of Boston, thus aptly illustrates this point: "My definition of the word 'Chimney' would be this: A long tube open at both ends, the lower opening called a 'Fireplace,' being used to receive fuel and to emit smoke; the upper to direct upon the roof from 85 to 95 per cent of the heat and smoke generated below."

Why is it, that with all of the active and latent talent among our inventors, no one can be found who is able to solve this perplexing problem? People seem to take it for granted that an open grate with a yawning throat up which the heat and flame roars is the only alternative for badly managed stove, furnace or steam heat. The ordinary grate is several degrees more uncomfortable, and extravagant in the use of coal, and infinitely more troublesome and dusty than either of the other heating appliances.

There is in market a grate that will if properly set and managed do away to some extent with some of the disadvantages noted. It has a double back and a lattice space between the two partitions. Through the lattice the heat, which ordinarily passes out of the flue or heats the chimney is turned into the room. This is a very great economy in generated heat. There is also an arrangement for supplying the air chamber with pure air, which is first heated and then sent into the room. This is the true principle of heating and ventilation without draft or current of cold air. No outer air comes into the apartment without first passing through the heated chambers. The air is therefore always tempered and there is no danger of cold feet or the extreme heat that so often causes headache.

When people can be made to comprehend that in extreme weather the air should be heated before it comes into the room, and that it is entirely possible with reasonable management to avoid all sudden and extreme changes of temperature and currents of air, there will be better health, longer life and more evenness of temper than is possible with the prevailing primitive methods of heating and ventilation.

A CURIOUS setting of a clock is in topping it with a bull's eye. Quaint medieval clock discs in bronze, gilded and adorned with brilliant pigments, are suspended by chains from bronze or terra cotta heads of elephants and lions, these being affixed to hard wood, carved in gothic style, for attachment to walls.